

About the National Coordination Office for NITRD

The NCO provides overall support for the planning, budget, and assessment activities of the NITRD Program, including the work of the NITRD Subcommittee, IWGs, and CGs. The NCO, reporting to OSTP, also provides technical support for the activities of the Networking and Information Technology Subcommittee of the President’s Council of Advisors on Science and Technology, which is charged with assessing the NITRD Program.

As the hub of NITRD interagency coordination, the NCO informs wider audiences about the Program and the evolving R&D challenges in advanced information technologies. The NCO prepares, publishes, and disseminates NITRD reports, reports of the President’s IT Advisory Committee, and related materials. The NCO also maintains the NITRD Web site, where information about the Program and electronic versions of NITRD documents are available – see <http://www.nitrd.gov>.

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- AHRQ** – Agency for Healthcare Research and Quality
- DARPA** – Defense Advanced Research Projects Agency
- DHS** – Department of Homeland Security
- DOE/NSA** – Department of Energy/National Nuclear Security Administration
- DOE/SC** – Department of Energy/Office of Science
- EPA** – Environmental Protection Agency
- NARA** – National Archives and Records Administration
- NASA** – National Aeronautics and Space Administration
- NIH** – National Institutes of Health
- NIST** – National Institute of Standards and Technology
- NOAA** – National Oceanic and Atmospheric Administration
- NSA** – National Security Agency
- NSF** – National Science Foundation
- OSD and Service research organizations** – Office of the Secretary of Defense and DoD Air Force, Army, and Navy research organizations

NITRD Program Strategic Goals

The NITRD Program is authorized by Congress through the High-Performance Computing Act of 1991 (Public Law 102-194) and the Next Generation Internet Research Act of 1998 (Public Law 105-305). The Program’s strategic goals are to:

- Provide R&D foundations for assuring continued U.S. technological leadership in advanced networking, computing systems, software, and associated information technologies
- Provide R&D foundations for meeting the needs of the Federal government for advanced networking, computing systems, software, and associated information technologies
- Accelerate development and deployment of these technologies in order to maintain world leadership in science and engineering; enhance national defense and national and homeland security; improve U.S. productivity and competitiveness and promote long-term economic growth; improve the health of the U.S. citizenry; protect the environment; improve education, training, and lifelong learning; and improve the quality of life



Federal agencies working together to develop a broad spectrum of advanced IT capabilities to power Federal missions, U.S. science, engineering, and technology leadership, and U.S. economic competitiveness

The U.S. Government’s Networking and Information Technology Research and Development Program

- High End Computing – Systems, Software, Infrastructure, Applications
- Cyber Security
- Information Assurance
- Human-Computer Interaction
- Information Management
- Large Scale Networking
- High Confidence Software and Systems
- Social, Economic, Workforce Implications of IT
- IT Workforce Development
- Software Design and Productivity





Since the dawn of the information age, the U.S. government’s long-term R&D investments in networking and information technology (IT) have been generating revolutionary breakthroughs – such as the technical architecture enabling the Internet, supercomputing, the computer mouse, the Web browser, and the search engine – that not only support critical Federal missions but drive U.S. scientific and technological innovation and economic competitiveness.

Today, that Federal leadership continues in the Networking and Information Technology Research and Development (NITRD) Program. A unique collaborative enterprise of 14 Federal agencies, the \$3 billion (President’s 2007 Budget) NITRD Program is the main Federal R&D investment portfolio in networking, computing, software, and related information technologies. NITRD is one of the few formal interagency R&D activities within the Government and is viewed as a model of interagency coordination and cooperation.

## How the NITRD Program Works Collaboration

The NITRD agencies work together in eight major research areas – called Program Component Areas (PCAs). In each PCA, agency program managers participate in an Interagency Working Group (IWG) or Coordinating Group (CG) that coordinates R&D activities such as multi-agency R&D efforts; budget and program planning; conferences, workshops, and seminars; technical reports and white papers; and preparation of the annual Supplement to the President’s Budget for the NITRD Program.

### Scope

The PCAs and their diversified R&D interests are:

**High End Computing Infrastructure and Applications (HEC I&A)** – R&D to extend the state of the art in high-end computing systems, applications, and infrastructure.

**High End Computing Research and Development (HEC R&D)** – R&D to optimize the performance of high-end systems and to develop future generations of high-end systems.

**Cyber Security and Information Assurance (CSIA)** – R&D to protect computer-based systems from actions that compromise or threaten to compromise the authentication, availability, integrity, or confidentiality of these systems, and/or the information they contain.

**Human Computer Interaction and Information Management (HCI&IM)** – R&D focusing on information interaction, integration, and management to develop and measure the performance of new technologies, agents, cognitive systems, and information systems that support the hierarchy and refinement of data from discovery to decision and action by both humans and computers working together and separately.

**Large Scale Networking (LSN)** – R&D to develop leading-edge networking technologies, services, and enhanced performance, including programs in new networking architectures, optical network testbeds, infrastructure, middleware, end-to-end performance measurement, and advanced components; grid and collaboration networking tools and services; and engineering, management, and use of large-scale networks for scientific and applications R&D; and network security applied to R&D networks, applications, and infrastructure.

**High Confidence Software and Systems (HCSS)** – R&D to enable the routine production of reliable, safe, and certifiably dependable systems by developing robust scientific foundations and technology for innovative systems design, systems and embedded application software, and assurance and verification.

**Social, Economic, and Workforce Implications of IT, and IT Workforce Development (SEW)** – R&D to study the co-evolution of IT and social and economic systems; develop the IT workforce, and develop innovative IT applications in education and training.

**Software Design and Productivity (SDP)** – R&D to advance concepts, methods, techniques, and tools that improve software design, development, and maintenance to produce more usable, dependable and cost-effective software-based systems.

### National Visibility

The NITRD Program is a top Administration R&D budget priority and a central component of the President’s American Competitiveness Initiative to boost U.S. science and technology innovation. The Program is coordinated by the Subcommittee on Networking and Information Technology Research and Development, under the aegis of the National Science and Technology Council.

Members of the NITRD Subcommittee include senior NITRD agency managers and representatives of the White House Office of Science and Technology Policy (OSTP), the Office of Management and Budget (OMB), and the National Coordination Office (NCO) for Networking and Information Technology Research and Development. The NITRD Subcommittee is co-chaired by the Director of the NCO and an agency representative from one of the NITRD Program member agencies.

### Technology Leadership

NITRD activities and reports help shape national R&D agendas in critical areas, such as supercomputing, optical networking, cyber security and information assurance, high-confidence medical devices, information integration, and socioeconomic impacts of emerging technologies. The R&D funded by NITRD agencies helps support the education and training of the Nation’s next generation of IT researchers.

### Technology Results with Societal Impact

Federal NITRD investments have produced a long list of R&D breakthroughs – TCP/IP, ARPAnet, the graphical user interface, reduced instruction set computer (RISC) architectures, redundant array of independent disks (RAID) storage technology, the domain name system (DNS), cluster computing, processor-in-memory (PIM), field-programmable gate arrays (FPGAs), the Lightweight Directory Access Protocol (LDAP), and mobile and hybrid networking, to name only a few.

The NITRD enterprise generates multidisciplinary innovations reflecting technical contributions from multiple agencies. Some examples:

- Computational decoding of the human genome, launching a new era of gene-based medical science
- Modeling and simulation of complex physical systems, such as aircraft, automobiles, power grids, and pharmaceuticals
- Visualization technologies in science, engineering, and medicine
- Near-real-time weather forecasts
- Climate models that are increasing human understanding of global climate change
- Pervasive mobile networking
- Unmanned aerial vehicles, search-and-rescue robots
- Collaborative distributed work environments
- Open digital libraries of fundamental knowledge in the sciences, mathematics, engineering, social sciences, and humanities
- Devices for assisted living
- Computer-based education and training

### Recent NITRD Publications

